



Master WATCHMAKING

SHOP TRAINING JOB GUIDES

LESSON 3

Fitting Watch Crystals and Watch Attachments
for Practice and Profit

—
Sections 70 - 86

CHICAGO SCHOOL OF WATCHMAKING

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MASTER WATCHMAKING

A Modern, Complete, Practical Course

CHICAGO SCHOOL OF WATCHMAKING

Founded 1908 by Thomas B. Sweazey

Lesson 3

**Sections
70 to 86**

FITTING WATCH CRYSTALS AND WATCH ATTACHMENTS FOR PRACTICE AND PROFIT

Sec. 70 — Millimeter — A Unit of Measure

Throughout your course and career in Watch Repairing, make it a practice to carefully determine the exact measurement of every piece of material used for replacements. Do not attempt to "guess." Guesswork is the method invariably used by careless workmen. Watches are made to exact measurements and gauges must be used to determine correct measurements for replacing or making parts.

Several standards of measurement are used by watchmakers. The English measures of length consisting of the inch, foot, etc., are not practical for our work. For instance, the inch is divided into so many divisions—16ths, 32nds, 64ths, 128ths, and 1000ths—that it requires mathematical skill to figure out the decimal equivalent of the parts of an inch. One cannot tell instantly that $7/64$ ths of an inch written decimally equals .10938 inch unless he has the equivalents memorized or a printed table at his elbow. Both methods are in common use.

In your work, you will use a unit of measure called a millimeter. The metric unit of length is the meter which is equal to 39.37 English

inches. Later a micrometer will be used which measures to $1/100$ of a mm. Mainsprings and watch glasses are being gauged by the metric system much more than formerly.

Sec. 71 — Lignes

The French "ligne" (line) is also used in watchmaking. The sizes of French and Swiss watches are designated in lignes. The ligne is $1/11$ of an English inch and $1/12$ of a French inch. A ligne equals 2.25 mm.

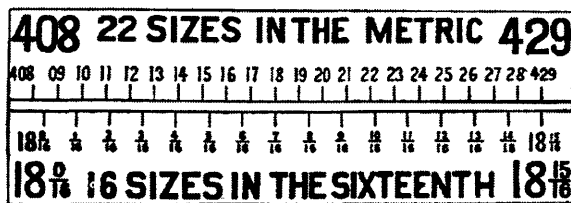
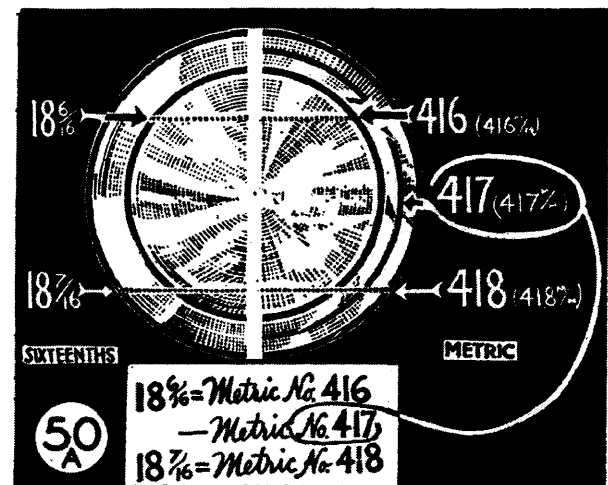


FIG. 50

inches. The millimeter is the one-thousandth part of a meter and the abbreviation is mm. Thus 1 mm equals 1 millimeter, 6 mm equals 6 millimeters, 20 mm equals 20 millimeters.

Pivots in watches, outside diameters of jewels and jewel holes are gauged in hun-



Sec. 72 — Comparison of Sixteenth and Metric Systems

Among the older watchmakers, there are many who use the sixteenth system. Figure 50 shows the units of 18s divided into sixteen parts, $18-0/16$ th to $18-15/16$ ths. The most modern system is the METRIC SYSTEM. In figure 50, notice the metric numbers 408 to 429, divided into 22 parts of $1/10$ th of a millimeter each. You have 22 sizes in the metric system and only 16 sizes in the sixteenth system. In other words you have more in-between sizes, figure 50A.

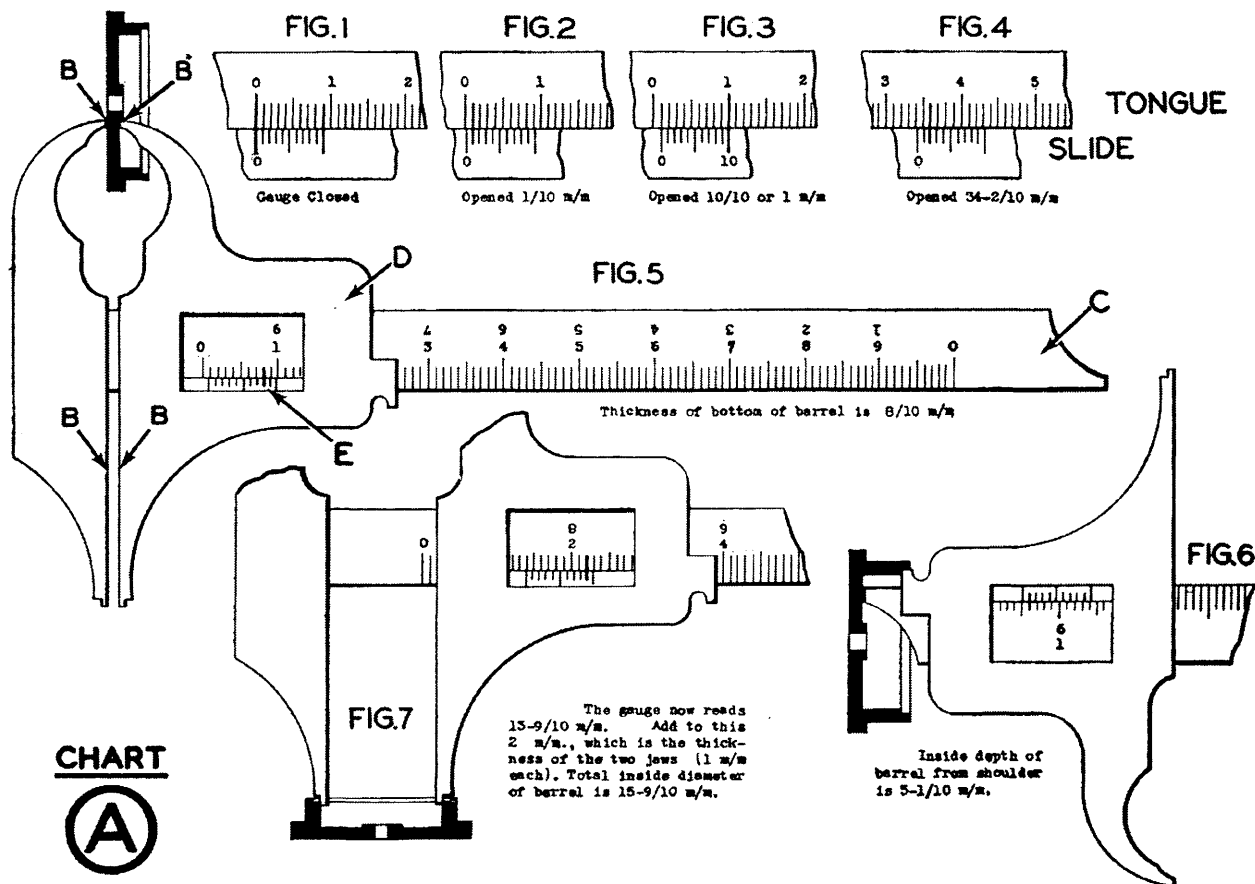
Sec. 73 — Reading a Millimeter Gauge

Chart A, figure 5, illustrates a common type of millimeter gauge. The jaws at B, figure 5, are for outside measurements. C is the tongue. D is the slide which contains a scale at E. This scale is NOT divided into millimeters. It is a Vernier Scale, and is used to divide a millimeter into 10 equal parts, making it possible to measure in tenths of a millimeter with a gauge of this type.

Notice the first ten divisions from 0 to 1 on the tongue, figure 1. Each one of these divisions

the gauge is used for depth measurements as illustrated in figure 6.

Figure 4 illustrates the slide measuring 34-2/10ths millimeters. Count the number of lines on the tongue before the 0 on the Vernier Slide. This is 34. Now notice which line on the Vernier Scale coincides with a line on the tongue scale (only one will coincide exactly); in this particular case, it is the third line or the end of the second division. This equals 2/10ths of a millimeter. Now add 34 plus 2/10ths written



equal 1 mm. The Vernier Scale located on the slide (figure 1) is divided into 10 equal sections and these ten divisions equal 9 divisions on the tongue. If the slide were moved so that the second line on this slide coincides exactly with the second line on the tongue scale, figure 2, the jaws of our caliper would be open one-tenth of a millimeter—3 lines two-tenths, 4 lines three-tenths, etc. Figure 3 shows a reading of 1 mm. If the line marked 0 on the slide, figure 3, were moved to the next line on the tongue, it would read 2 mm and so on up the tongue which has a total of 100 mm. The small inverted figures on the tongue, figure 5, are for reading when

34.2 mm. All measurements are read exactly the same way in measuring the depth, figure 6, and outside measurements, figure 5.

Inside measurements are taken as shown in figure 7. In this particular case, the gauge reads 13.9 mm. However, as this reading is the measurement between the jaws, it is necessary to add 2 mm, the thickness of the two jaws (one mm each), to the total making a total inside measurement of 15-9/10ths mm. It will take some time to become accustomed to measuring in millimeters if you have never used the metric system before. You should practice by using your millimeter gauge at every

opportunity. There is very little in watch repairing, especially in the more advanced work, that does not require the use of either a millimeter gauge or micrometer.

Interest, accuracy and progress in watchmaking will be assured when reading of the millimeter gauge is mastered.

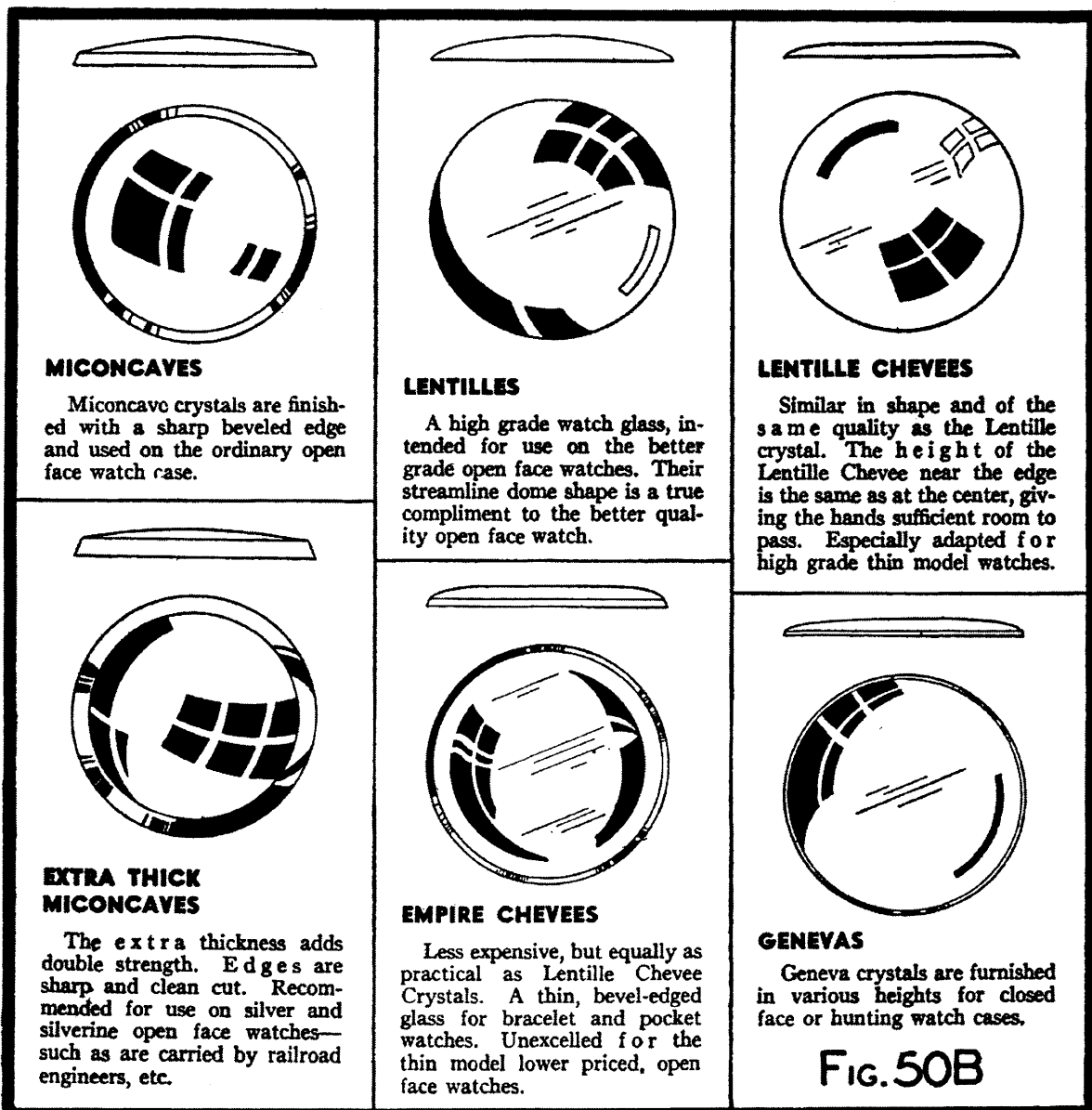
Sec. 74 — Profits from Watch Crystals

The fitting of watch crystals or watch glasses is a lucrative part of the watch repair business. Practically every watch purchased in the United States is brought into the watch repair shop for a new crystal at some time. It is an essential part of the repair business and the watch repair man can create an abundance of

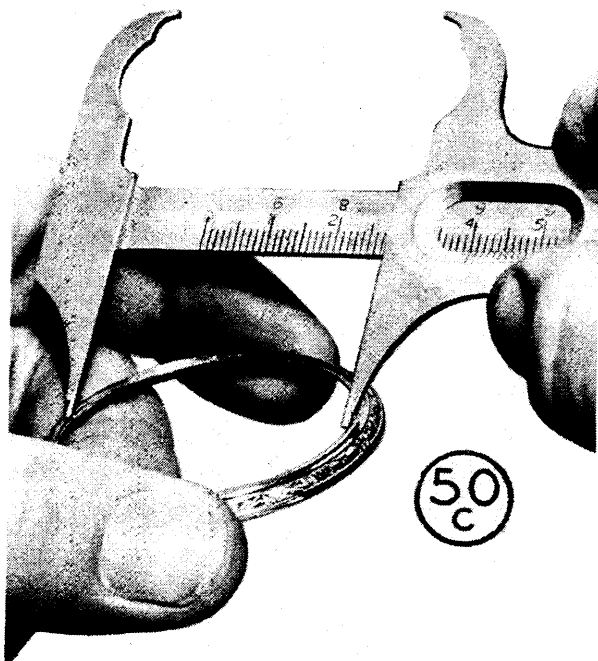
good will and an excellent profit if he can give quick service. The repair man who is on his toes realizes that quick service without sacrificing quality is a sure way to keep his customers. Many stores carry an immense stock of crystal blanks. It would be impossible for the beginner to stock the thousands of sizes and shapes of watch crystals. Part of this lesson will explain how you can make watch crystals fit practically any style watch case with a little practice and without a great deal of investment.

Sec. 75 — Fitting Round Watch Glasses

The first step is the fitting of round watch glasses. Glass is probably the best material for use in protecting the face of a watch. Glass has one fault; it will break. However, it



does not scratch easily and if "snapped in" properly, it will not come out. You may have customers who are constantly breaking crystals and will desire one that will not break. A good repair man is always equipped to give his customers what they prefer. Unbreakable watch glasses are clear and flexible. The round No Breaks are most always inserted with force. The main objection to non-breakable watch



glasses are that they will scratch and, in some instances, when too much pressure is exerted on the center of the non-breakable glass, there is a possibility that the hands or the center pinion may be damaged. Some have a tendency to shrink and, after a long period of time, there is a possibility of the non-breakable crystal falling out.

Sec. 76 — Types of Round Crystals

In figure 50B are shown the characteristics of round glasses with the trade names listed below each illustration.

For all practical purposes, the Lentille is probably the most satisfactory for use on open face watches, as it allows more room for the hands and is neater.

The Miconcave and extra thick Miconcave are used on the older types of watches and on railroad models where more strength is needed than can be supplied by a Lentille.

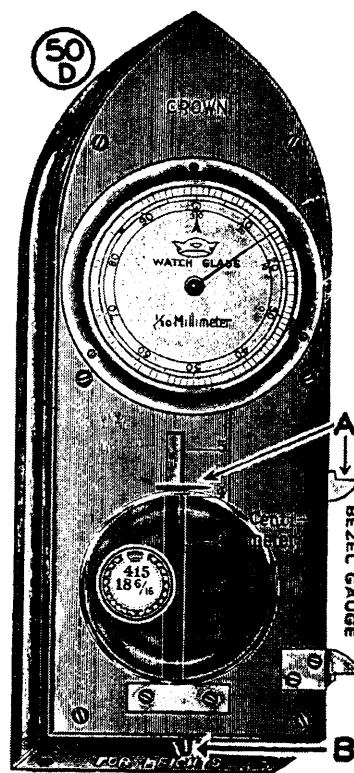
Sec. 77 — Fitting Crystal to Open Face Watch

To fit a watch glass to an open face watch, remove bezel. Be certain the bezel is clean and

that no broken bits of glass or dirt remain. Figure 50C illustrates the method used in measuring a bezel with a millimeter gauge. The reading of the scale in this case is exactly 39.5 mm. However, we are not using the inside of the jaws which is the distance the 39.5 mm represents. It is necessary to allow for the thickness of the jaws (1 mm each) or 2 mm making our actual measurement 41.5 mm. On the modern metric crystal charts the decimal point and the mm are dropped leaving only the figure 415 which represents the size of our crystal. 41.4 mm equals No. 414; 21.6 mm equals No. 216, etc.

Figure 50D illustrates a type of crystal gauge which measures in the metric system.

In figure 50-D notice the two arrows at A. The longer arrow indicates the movable jaw used to measure the outside diameter of a round watch glass. The shorter arrow indicates the



movable jaw used to measure the opening in the bezel. The divisions shown on the vertical scale are centimeters which we convert into millimeters as follows:

1	Centimeter	=	10	Millimeters
2	"	=	20	"
3	"	=	30	"
4	"	=	40	"
5	"	=	50	"

The circular scale is divided into tenths of a millimeter. The total is obtained by combining the reading on the vertical scale and circular scale:

Example:

Reading on Vertical Scale: 40 mm

Reading on Circular Scale: 1.5 mm

Total: 41.5 mm

Remove the decimal point and the size of glass illustrated is 415.

Sec. 78 — Inserting

In the modern shop, you would select from stock glass No. 415. If the glass selected did not snap in, you would try another of the same measurement until you found the correct size.

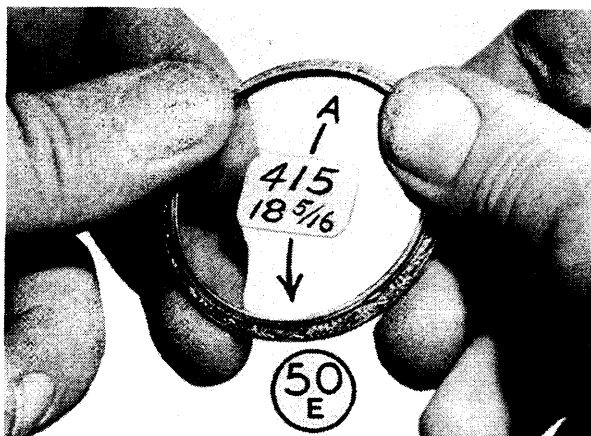


Figure 50E shows how to insert glass. Put glass in lower edge of bezel with thumbs and fingers, draw the glass in direction indicated by Arrow A until glass snaps in. Remove label, clean watch glass both inside and out, dry thoroughly and replace on case.

Sec. 79 — The Geneva Crystal

The Geneva is used only on hunting case watches, Lesson 1, figure 11. These crystals are very thin and although the sizes are metrically the same, they would break if used on an open face watch.

For measuring the height of Geneva crystals, the gauge illustrated in figure 50D can be used as follows: Press the underside of the watch glass against the small rod projecting through the lower end of the gauge at B and the pointer will indicate the height on the inner circle figures 0, 10, 20, and 30 as follows:

24=Height 4

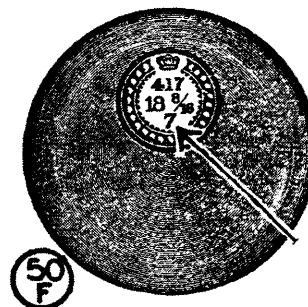
20=Height 5

16=Height 6

12=Height 7

8=Height 8

Notice in figure 50F this label has a small number printed on it, in this case, No. 7. This refers to the height of the crystal. In the older types of hunting case watches, this number would usually be No. 5, meaning 5 high. The different heights are 4, 5, 6, 7 and 8. The thinner

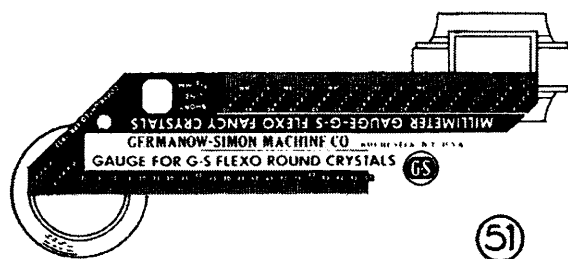


models use 7 or 8 high. There are so few of these watches in use today it is hardly profitable for the average man to carry a complete stock of Geneva glasses. It is more profitable to order from a regular material house. Be sure when ordering to send the bezel and, if possible, the case so that the correct height may be selected.

Sec. 80 — Selecting Fancy Watch Crystals

Figure 51 is a crystal gauge for measuring fancy and round crystals. When measuring a fancy case with a G-S Crystal Gauge, it is difficult to obtain its exact size to a tenth of a millimeter. SOME G-S Crystals are made 1 to 4 TENTHS OVERSIZE to fit cases which vary

DIMENSIONS OF G-S FANCY AND ALSO (G-S ROUND) CRYSTALS (SIZES FROM 8.4 TO 127) ARE GIVEN IN MILLIMETERS. G-S ROUND FROM 1/4 SIZE TO 70 ARE GIVEN IN SPECIAL G-S SIZES.



slightly in size. Therefore, when selecting a crystal, always try a size from 1 to 4 tenths smaller. You will often find that this crystal will fit correctly with very little filing, if any.

More than ever the fancy watch crystals are becoming more popular. There are thousands of different sizes and shapes.

This is the Chart of KK Fancy Crystal Shapes

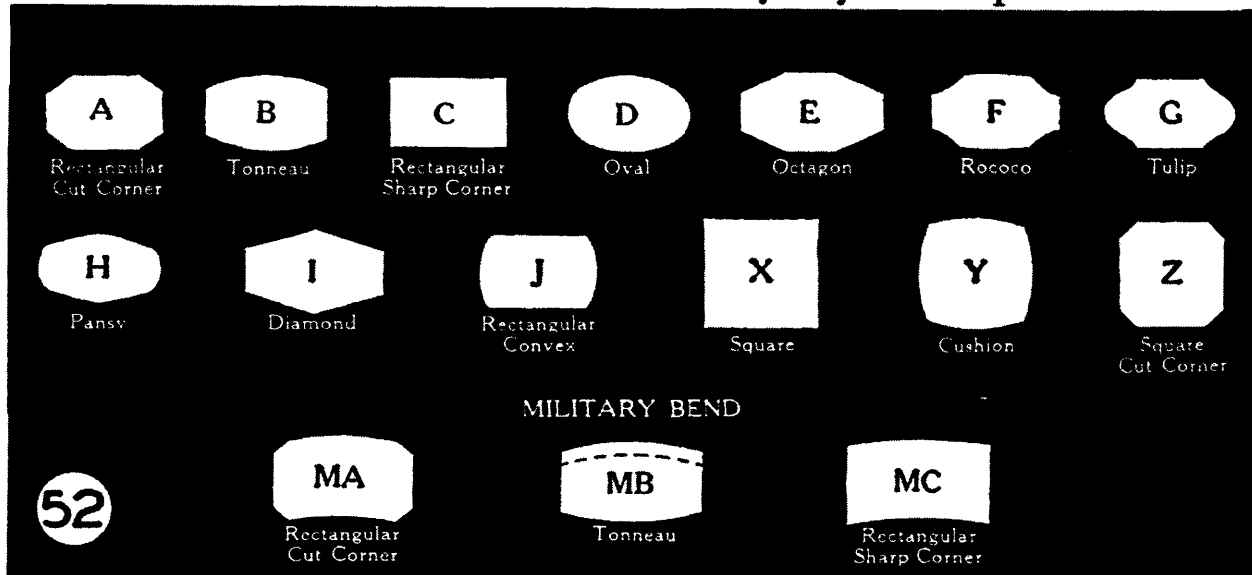
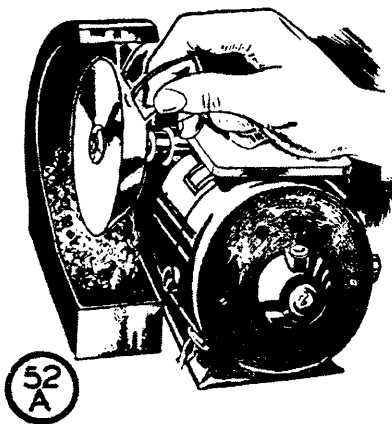


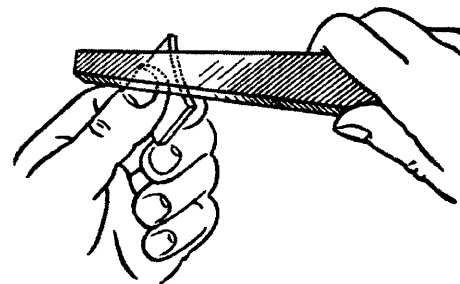
Figure 52 shows an illustration of a few of the many shapes. These shapes can be obtained in glass or non-breakable and usually have to be touched up with a glass grinding wheel, figure 52A, or with a file, figure 52B, for the non-breakable.



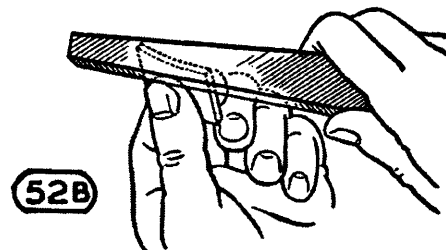
In ordering fancy crystals, first determine the shape as in figure 52. Measure the length and width in mm, fig. 52C, or as illustrated in fig. 51. Now select your crystal according to shape, length and width and fit into bezel. There are many shapes on the market and you should obtain a crystal catalog from the concern you select as your supply house.

Sec. 81 — Tools and Material to Make Your Own Crystals

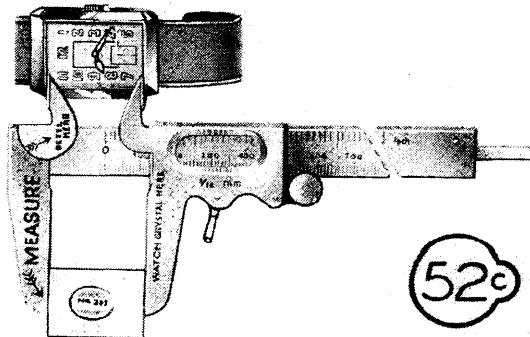
As has been explained, the better equipped shops carry many different styles and shapes of watch crystals. This enables them to give quick service. However, for the man starting in

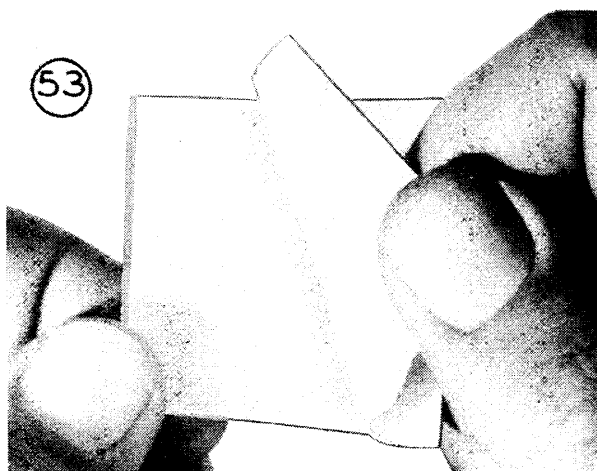


Wrong way of filing—Do not file crosswise.



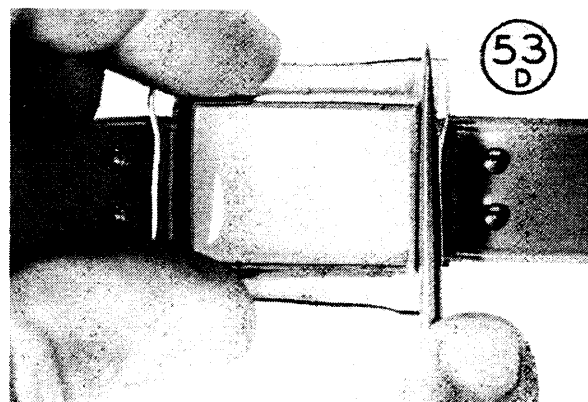
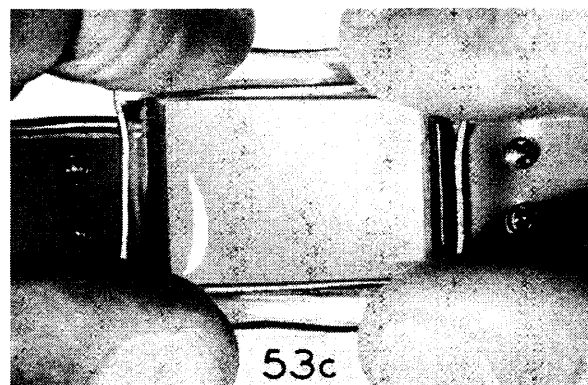
Right way of filing—Hold as illustrated with the thumb on dome side of crystal. File lengthwise on edge and form a slight bevel on crystal.





business, it is profitable to make his own crystals. This also gives practice fitting different shapes of bezels. When you have advanced far enough to take a job it will be a simple matter to touch up crystal blanks that come very close to being the correct size. For this lesson, we will need beside our crystal blanks, the following:

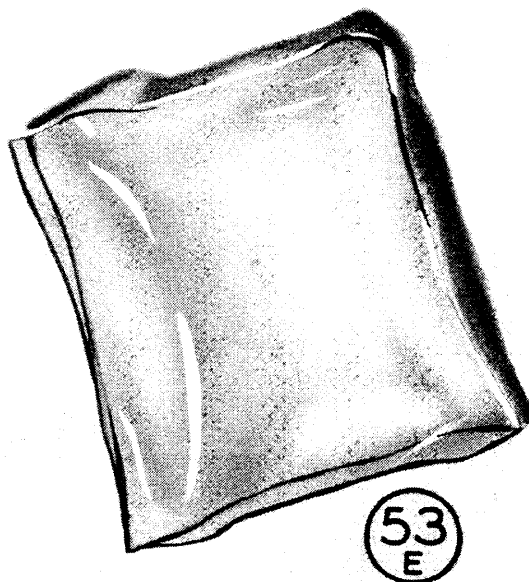
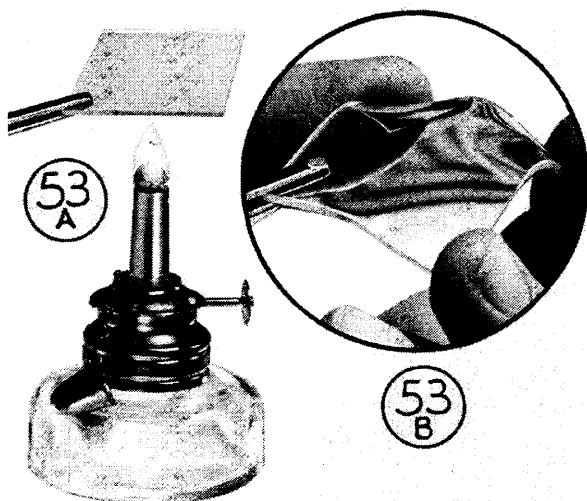
- Alcohol lamp
- Flat file
- Cutting pliers
- Coping saw
- Crocus cloth
- Silver paste
- Crystal cement
- Stylus or awl
- Dome shaped glass lense or paper weight
- Soldering tweezers
- Clean bezel thoroughly, removing dirt and bits of broken crystal.



Sec. 82 — Cutting and Shaping Material

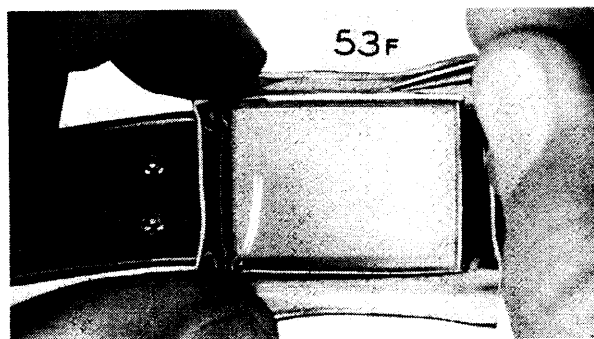
The procedure in cutting and shaping material is as follows:

Remove paper cover from crystal blank, figure 53. The size of the crystal blank should be



approximately $\frac{1}{2}$ inch longer and wider than the bezel to be fitted.

Heat crystal blank over alcohol lamp as shown in figure 53-A until blank is soft and pliable.



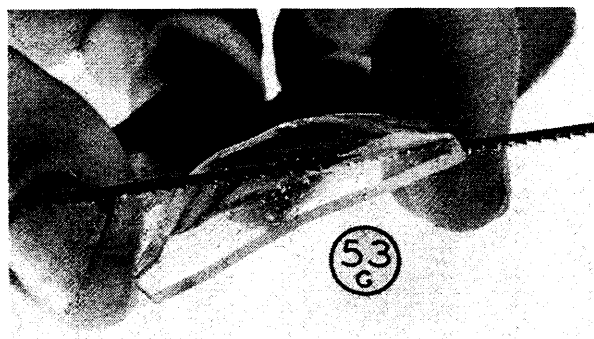
Quickly place blank over frame of bezel, figure 53-C, and with fingers mould edges over sides of case.

Carefully apply heat to ends of blank and using the awl form over each end of case as in figure 53-D.

The blank should appear similar to the one illustrated in figure 53-E. The amount of curve or dome to the crystal should be of sufficient height so that the hands will have ample clearance.

With a scribe, scratch outline of the bezel as in figure 53-F allowing about $\frac{1}{16}$ th inch for finishing.

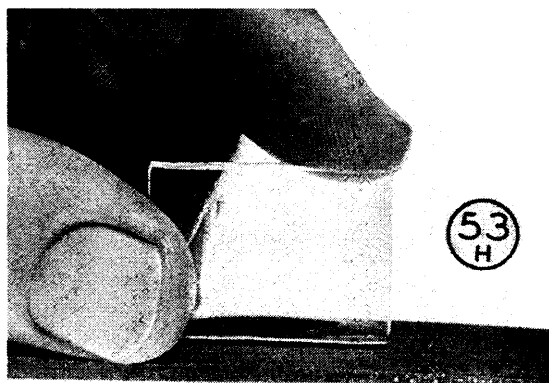
Using coping saw, cut away surplus material from both ends and sides, figure 53-G.



Place flat file on bench and draw crystal across cutting teeth of file, figure 53-H, until edges are straight and smooth and crystal will snap in bezel.

To polish edges of crystal repeat the above method, using crocus cloth and silver paste, figure 53-J.

This is the simpler form of watch crystal and if on your first attempt you do not get a perfect fit, do not be discouraged. It will take practice but eventually you will be able to turn them out rapidly.



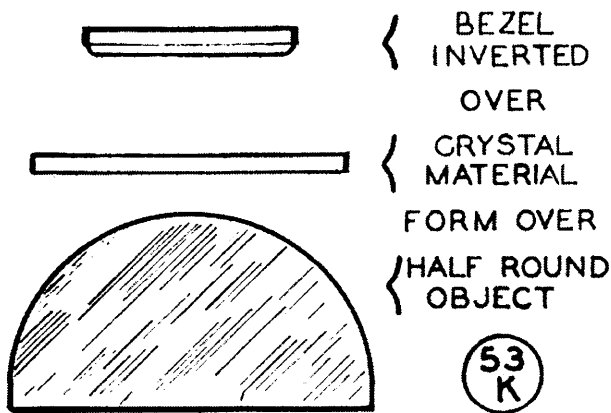
NOTE: Always file two opposite sides to fit first.

Sec. 83 — Doming Round Crystals

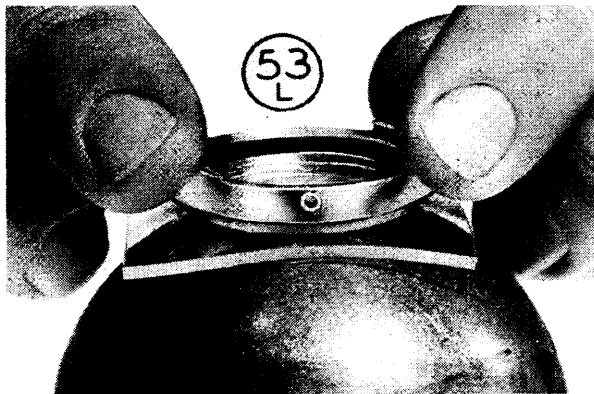
Your ingenuity will be taxed in making the various sizes and shapes that will be encountered. Individual instructions cannot be given on the thousands of different sizes and shapes. These instructions are basic instructions. In fitting other crystals such as square, round, etc., it is necessary to dome our crystal by another method. It would be fine if a mold for each different size could be made, but this is im-



practical and expensive. A round glass paper weight, optical lense or wood block about 2 inches in diameter and $1\frac{1}{2}$ inches high with a smooth surface can be used for this purpose. Figure 53-K is a sectional view of such an object.



After selecting a blank, heat over alcohol lamp as before until blank is pliable. Now quickly place blank over block and with the bezel to be fitted inverted, hold blank until cool, figure 53L. Remove and you will have an outline of the bezel in the blank which now should be domed



high enough for hands to pass. At this point, there are likely to be a few bubbles in the glass. If so, pass blank through flame two or three times until bubbles disappear. Trim and finish as before.

Use cutting pliers instead of saw to trim crystal blank as illustrated in figure 53-M.

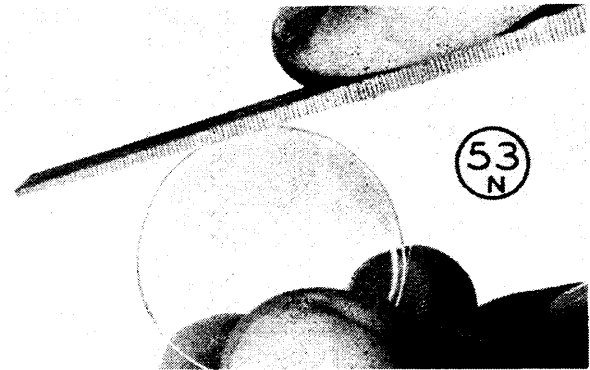
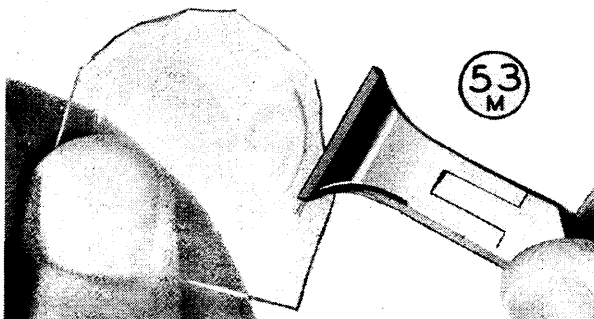
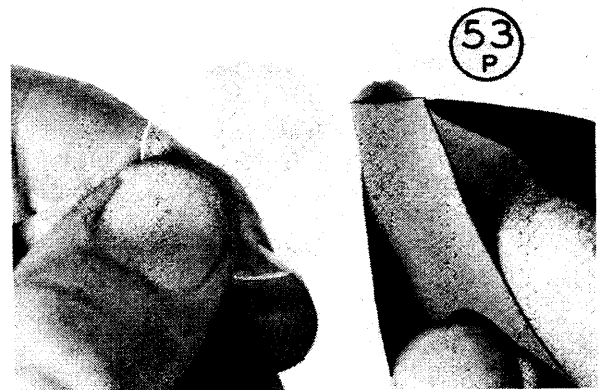


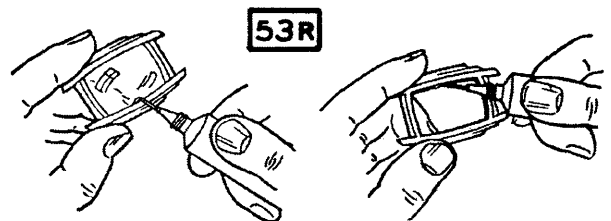
Figure 53-N illustrates the method used to file a round crystal.

Figure 53-P illustrates the use of crocus cloth or crocus cloth and silver paste to polish edge.

Use the methods described or combination of methods best suited for each job.



After crystal is snapped in, flow crystal cement around edge of bezel sealing it against dust, figure 53R. A properly fitted crystal should snap in; the cement is used primarily to exclude dust. Practice on as many different types of watch bezels as possible and you will soon be in a position to turn them out rapidly. It will not be hard to reach the speed of 3 to 5 an hour at substantial profit.

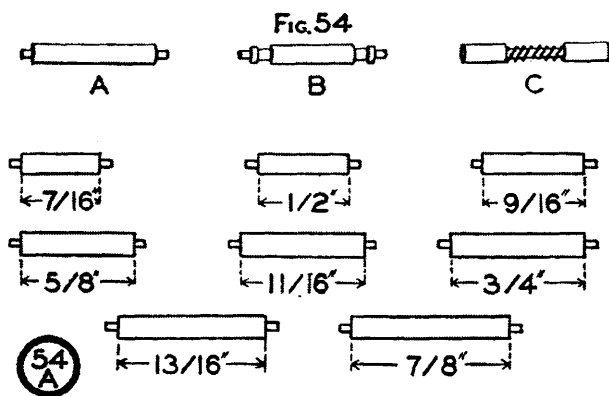


1. For Dustproofing—After crystal is inserted, apply point of tube around outside edge of groove and crystal. Press tube very lightly, cement will fill in any openings.

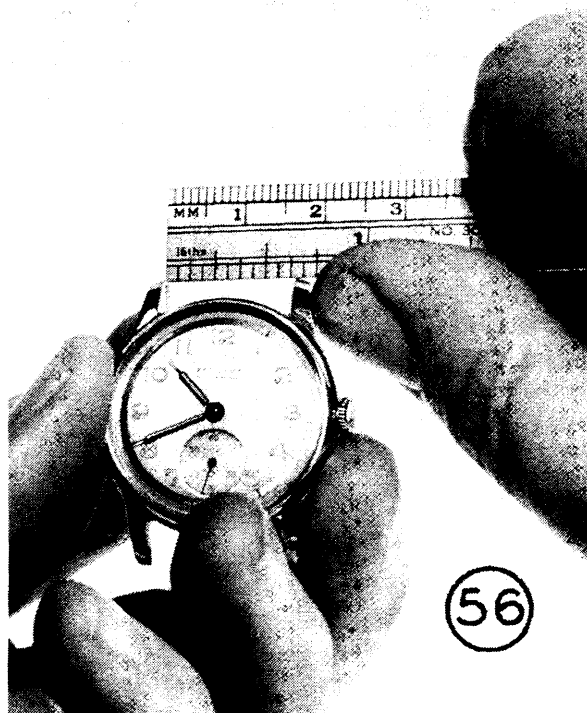
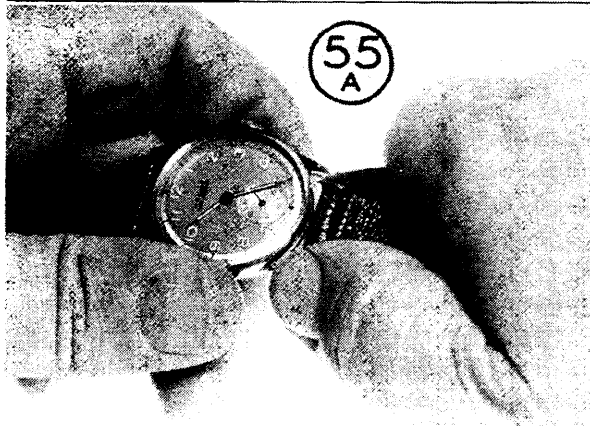
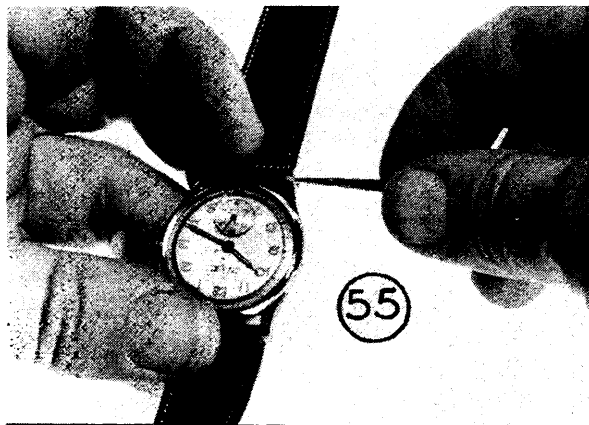
2. For Cementing — When crystals are fitted improperly, loose or in very shallow grooved cases, apply cement direct to groove; then insert crystal.

Sec. 84 — Spring Bars

This is another profitable part of your business. Most men's wrist watches and some models of ladies' sport watches use leather straps to



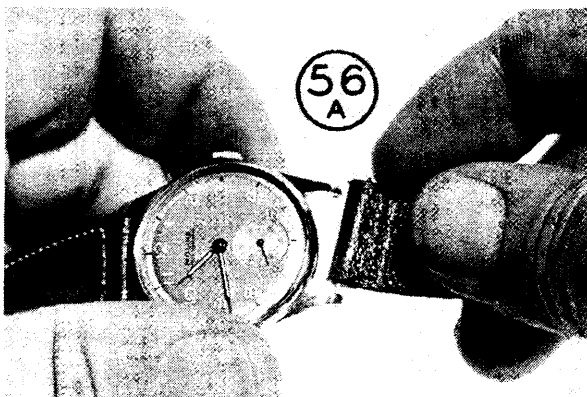
keep watch in place. The majority of leather straps are held in place by spring bars, figure 54. This is enlarged to show detail. Figure 54A shows actual sizes with the corresponding measurement listed below each spring bar. Figure 54 illustrates three types of spring bars: A, the single shoulder, B, the double shoulder, and C, the Female spring bar used with cases



having pins instead of holes in the lugs of the case figure. The double shoulder spring bar is the one preferred in most cases. Remove as in figure 55 or figure 55A.

Sec. 85 — Fitting Watch Straps

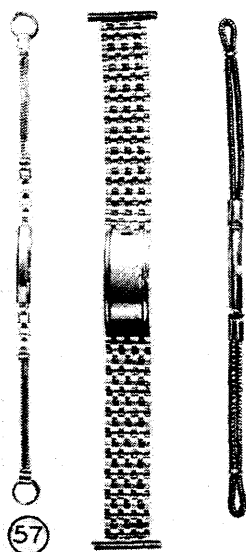
Leather straps can be purchased from 1/2 inch to 15/16 inches wide. In order to select the correct size of strap or spring bar, measure distance between lugs, figure 56, with an ordinary rule which measures in sixteenths of an inch. Select strap of the same width and after slipping spring bar through strap, figure 56A, replace on watch. Usually the shorter piece of strap contains the buckle and is replaced between lugs on section of case near the figure twelve on dial.



Always determine which way customer prefers strap by examining position of buckle when removing old strap. There are many good qualities of straps and your dealer can supply most any kind desired. In most cases, the regular length is used but there are times when a man with an extra large wrist needs an extra long strap or, in other cases, where it is necessary to use an extra short strap. In either case, when ordering straps, be sure and specify Regular, Extra Long or Extra Short. Example:

- 1 Regular Calfskin $\frac{5}{8}$ Inch Regular
- 6 Pigskin
 - 2 Regular $\frac{3}{4}$ Inch
 - 2 Extra Short $\frac{5}{8}$ Inch
 - 2 Extra Long $\frac{1}{2}$ Inch

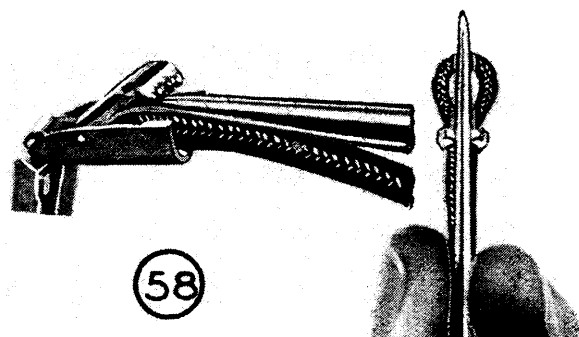
Keep a good supply of spring bars and straps on hand. The $\frac{5}{8}$ inch width is the most commonly used.



Sec. 86 — Replacing Cords

Most ladies' watches, especially the smaller sizes, are held in place on the wrist by cord or metal bands. Figure 57 illustrates three common types of watch bands or watch attachments. A is a metal watch band for ladies' watches. B is a metal watch band for men's watches. C is the cord type of attachment used mainly on ladies' watches. In most cases, metal bands cannot be repaired except by the factory. The cord type ladies' watch band frequently needs new cords and these are easily replaced at a profit.

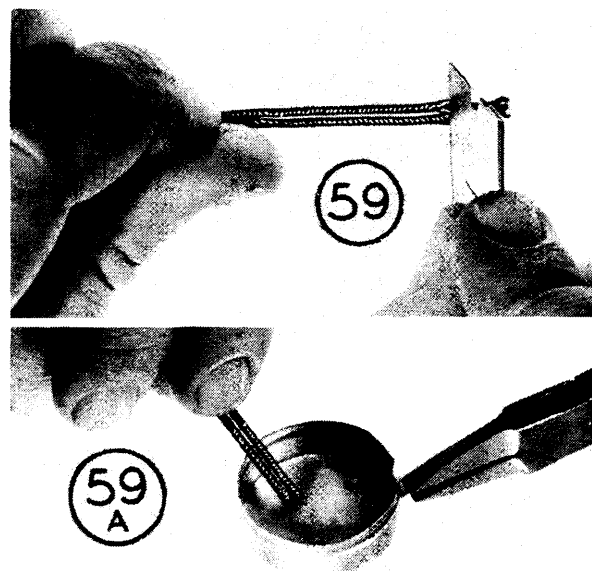
When the cord is worn out on band, it is only necessary to replace the cord. The metal attachments, in most cases, are used over again. Metal bands come in a great many styles



and from a variety of manufacturers. Usually when broken, the customer is delighted if shown a new one. However, replacing cord bands is another way to give a customer quick service. It is only a matter of a few minutes and small investment to replace cords quickly. There are several different diameters of cords used and other colors than black, such as rose and brown, are available. The most used size is called .075.

Material: Cord
Ordinary Paraffin
Alcohol Lamp
Awl

Melt a small amount of paraffin into a metal container such as a material box, figure 59-A. Remove the catches and the small clamps at each end of cord with awl, figure 58. Cut a piece of new cord for each side exactly the same length as the ones you are replacing. Use a razor blade, figure 59. Heat wax until it is melted and dip ends of cord into melted paraffin and remove quickly, figure 59-A. Let cool, replace cords, clasps and clamps and job is done.



HOW TO FIT G-S FLEXO ROUND CRYSTALS

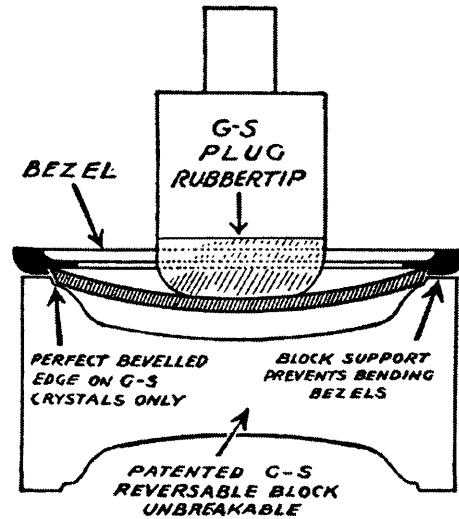
1. Measure bezel with G-S gauge exactly across center. The size is where the line on gauge meets groove. Use crystal not more than $\frac{1}{2}$ size larger than bezel.

Example—when bezel measures $40\frac{1}{2}$ —use crystal size 41. **Do not use size $41\frac{1}{2}$.**

Exception—For pocket watches with deep grooved bezel, a crystal one size larger may be necessary. Never stretch crystal over one size larger than bezel.

2. Select block marked No. 41, (same size as crystal). Number in center of each block indicates number of plug to be used.

3. Lay crystal in groove of block (sharp edge up). Hold bezel over crystal (do not lay it down). Press foot pedal lightly to hold crystal in place. Then catch edge of crystal on groove of bezel on one side and gently with gradually increasing pressure on foot lever reduce crystal enough to snap into bezel groove. (When crystal is inserted do not remove hands from bezel until foot pressure is released.)

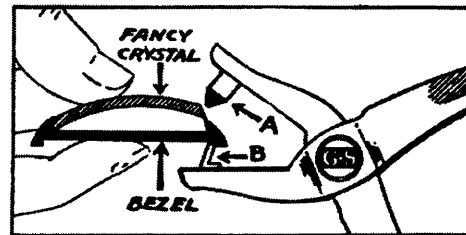


This illustration shows the only practical and successful Round crystal inserting method.

G-S Crystal is placed in groove of Block. Plug is pressed down in center, the beveled edge of crystal raises on the curve of block, entering the groove of bezel, holding firmly under compression.

HOW TO USE THE G-S FANCY CRYSTAL INSERTER

When fitting a G-S Fancy crystal, it is often difficult to force the final edge of the crystal into the bezel with fingers. Crystal can be forced into bezel more easily and quickly with the aid of a G-S Crystal inserter, as illustrated.



G-S Crystal Inserter—Patent No. 1916024

1. Do not apply inserter on crystals that are too large. Crystal should be only a trifle larger than case, and fitted into most of the groove by hand before inserter is applied.
2. Hold the fitted part of crystal and bezel tightly with fingers as illustrated.
3. Place anvil (B) of inserter on inside of bezel.
4. Hold bezel or case parallel to lower jaw of inserter so that rubber (A) is in contact with exposed edge of crystal. With a rocking motion, apply SLIGHT PRESSURE, while gradually following exposed edge of crystal until completely inserted. BE VERY CAREFUL ON THIN SOFT METAL CASES.

TABLE OF CONTENTS: Unit W1 - Lesson 3

JOB SHEETS

W3-J1 - Crystal: Round Glass.

W3-J2 - " Round Unbreakable.

W3-J3 - " Fancy Shaped.

W3-J4 - Spring Bars

UNIT	W I
LESSON	3

Master Watchmaking
CHICAGO SCHOOL OF WATCHMAKING

JOB SHEET
W3-J1

CRYSTAL: Round glass

TOOLS, EQUIPMENT AND SUPPLIES

Case opener

PROCEDURE

REFERENCE

A. HOW TO FIT A ROUND GLASS TO AN OPEN FACE CASE

Lesson 3

1. Remove bezel.
2. Clean bezel.
3. Determine inside diameter of bezel.
4. Select glass.
5. Insert crystal and cement.
6. Clean.
7. Replace bezel on case.
8. Check hands.

Fig. 50C - 50D

Fig. 50B

Fig. 50E

Sec. 78

B. HOW TO FIT A ROUND GLASS TO A HUNTING CASE

Lesson 3

1. Remove bezel.
2. Clean bezel.
3. Determine inside diameter of bezel.
4. Determine height. (Heavy case height 6)
(Medium case height 7)
(Average heavy height 8)
5. Select glass.
6. Insert crystal and cement.
7. Clean.
8. Replace bezel on case.
9. Check hands.

Fig. 50C - 50D

Fig. 50F

Fig. 50E

Sec. 78

UNIT	WI
LESSON	3

Master Watchmaking
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JOB SHEET
W3-J2

CRYSTAL: Round unbreakable

INTRODUCTORY INFORMATION

Unbreakable watch crystals are rapidly replacing watch glasses. Made of a different type of plastic which has been developed to retain its transparency and not be affected by solvents such as alcohol, benzine and watch cleaning solutions. However, it is recommended that non-breakable watch crystals be cleaned only with water.

TOOLS, EQUIPMENT AND SUPPLIES:

Crystal gauge or Millimeter gauge - Inserter set

PROCEDURE

HOW TO REPLACE ROUND UNBREAKABLE CRYSTALS

1. Remove bezel.
2. Clean bezel.
3. Measure bezel with crystal gauge.
4. Select crystal - Depending on the assortment on hand, allow 1/4 size larger or if using the metric system about 15/100 mm larger or if using the inch system about 6/1000 of an inch larger.
5. Select male and female plug and place in the inserting tool. Diameter of female plug should be slightly less than the full diameter of the crystal. Male inserter plug should be about 2/3 of the inside diameter of the bezel.
6. Place bezel over male inserter plug.
7. Place crystal on male inserter plug and hold in position with female inserter plug brought into position so crystal is centered.
8. Apply pressure which will push edge of crystal down until bezel will slip over edge of crystal.
9. Turn crystal back and forth while releasing pressure slowly to seat crystal.
10. Clean crystal and replace bezel on case.
11. Check hands.

UNIT	WI
LESSON	3

Master Watchmaking
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JOB SHEET
W3-J3

CRYSTALS: Fancy shaped

INTRODUCTORY INFORMATION

The beginner will generally find it more profitable to send his fancy crystal making to a material dealer who can handle this work.

TOOLS, EQUIPMENT AND SUPPLIES:

Glass grinding wheel - Crystal gauge - Crystal cement

PROCEDURE

REFERENCE

HOW TO FIT FANCY SHAPED WATCH CRYSTAL

1. Remove movement from case.
2. Remove broken glass and clean bezel.
3. Determine shape.
4. Measure length and width with crystal or millimeter gauge.
5. Shape glass on grinding wheel until it snaps into bezel. Fig. 52A
- 5a. If unbreakable type, shape with file. Fig. 52B
6. Cement edge and allow to dry. Fig. 53R
7. Clean with damp cloth and replace movement.
8. Check hands.

UNIT	WI
LESSON	3

Master Watchmaking
CHICAGO SCHOOL OF WATCHMAKING

JOB SHEET
W3-J4

SPRING BARS

TOOLS, EQUIPMENT AND SUPPLIES:

Spring bar remover

PROCEDURE

REFERENCE

HOW TO REMOVE AND REPLACE SPRING BARS

1. Check holes in lugs of case to determine if they are through.
2. If holes are through the lugs, use pin end of spring bar remover to depress and release the spring bar.
3. If holes do not come through, insert flat end of spring bar remover (or suitable substitute) between lug and shoulder of spring bar and force back the end.
4. In the case of a metal band which fits snugly between the lugs, a jeweler's saw may be used to cut the spring bar.
5. Measure space between lugs.
6. Select and replace spring bar.

Fig.55

Fig.56

Fig.56A